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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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MARIA S SWIATEK  
FLEHR HOHBACH TEST ALBRITTON & HERBERT  
FOUR EMBARCADERO CENTER SUITE 3400  
SAN FRANCISCO CA 94111-4187

EXAMINER

LUND, J

ART UNIT

PAPER NUMBER

1763

7

DATE MAILED: 05/21/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

<b>Office Action Summary</b>	<b>Application No.</b> 09/457,929	<b>Applicant(s)</b> YAO ET AL.	
	<b>Examiner</b> Jeffrie R. Lund	<b>Art Unit</b> 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some \* c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☐ received in Application No. (Series Code / Serial Number) \_\_\_\_.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

### Attachment(s)

- 14) ☐ Notice of References Cited (PTO-892)
- 15) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 16) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 17) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 18) ☐ Notice of Informal Patent Application (PTO-152)
- 19) ☐ Other: \_\_\_\_\_

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## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1, 2, 5, 8, are rejected under 35 U.S.C. 102(e) as being clearly anticipated by MacLeish et al, US Patent 5,891,251.

MacLeish et al is discussed in paragraph 3 of the first office action, and includes a graphite susceptor that has a recessed portion with an upwardly inclined surface that supports the substrate around the entire periphery edge of the substrate. Graphite has a coefficient of thermal expansion in the range of  $2.6 \times 10^{-6}$  to  $5 \times 10^{-6}/^{\circ}\text{C}$ , and thermal conductivity in the range of 40 to 70 W/m/K.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 3, 4, 6, and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over MacLeish et al, US Patent 5,891,251.

MacLeish et al differs only in specific dimensions for the diameter, depth, and recessed region angle. The optimizing of these parameters is obvious as indicated in paragraph 5 of the first office action.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over MacLeish et al, US Patent 5,891,251.

MacLeish et al differs only in the material of construction. Silicon carbide, aluminum nitride, silicon or silicon/silicon carbide alloy are all well known materials of construction, and are commonly used to make susceptors. The selection of a specific material is a basic engineering skill and one of ordinary skill in the art at the time the invention was made would be able to select an appropriate material from which to make the susceptor. Therefore, it would have been *prima facie obvious* to one of ordinary skill in the art to make the susceptor out of silicon carbide, aluminum nitride, silicon or silicon/silicon carbide alloy.

6. Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over MacLeish et al, US Patent 5,891,251, in view of Chen et al, US Patent 5,837,058.

MacLeish et al was discussed above.

MacLeish et al differs from the present invention in that MacLeish et al does not teach a susceptor made of silicon carbide, aluminum nitride, silicon or silicon/silicon carbide alloy that holds a 200 mm wafer.

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Chen et al teaches a susceptor made of graphite with an aluminum nitride layer for holding a 200 mm wafer.

The motivation for coating the susceptor of MacLeish et al with a layer of aluminum nitride is to protect the graphite from damage caused by chemical attack as taught by Chen et al. The motivation for making the recessed region is about 200 mm is to hold a 200 mm wafer as taught by Chen et al.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to coat the susceptor of MacLeish et al with an aluminum nitride layer, and make the recess 200 mm in diameter to hold a 200 mm substrate as taught by Chen et al.

### ***Response to Arguments***

7. Applicant's arguments filed February 28, 2001 have been fully considered but they are not persuasive.

In regard to the argument that the susceptor of MacLeish et al is made out of graphite not silicon carbide, the examiner agrees.

In regard to the arguments that the susceptor of MacLeish et al is not thermally expansion matched to the wafer and thus is subject to causing detrimental relative movement between the wafer and susceptor during heating, the examiner disagrees. Graphite has a coefficient of thermal expansion in the claimed range. (See Engineered Materials Handbook, table 10, page 830) Furthermore, this limitation is not claimed.

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In regard to the argument that MacLeish et al teaches minimum contact with the substrate thereby minimizing conductive heat transfer, the examiner agrees. However, the examiner note that MacLeish teaches minimizing the contact points by supporting the substrate by the entire peripheral edge, as opposed to supporting it by the entire backside of the substrate. MacLeish et al clearly teaches that the substrate is supported by the entire peripheral edge in figure 7 in view of figures 3A, 3B, and 5.

### ***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (703) 308-1796. The examiner can normally be reached on Monday-Thursday (6:30 am-6:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-5408 for regular communications and (703) 305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Jeffrie R. Lund  
Primary Examiner  
Art Unit 1763

jrl  
May 18, 2001